

Drift in an Anthropocene: On the work of terrain

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Abstract

As geographers confront the manifold challenges of an Anthropocene, so the framing of geography as the critical study of space – a framing that took hold of theory and practice in the 20th century and that searched for antecedents as well as prognostications – is increasingly splayed across the long durée of geography as the interrogation of the nature of human being as well as the Earthly environment and the constitutive relations between these. While the prospect of a new geologic epoch situates these Anthropocene challenges as the conjunction of a human history with the deep time of the planet, it also suggests, for example, the entanglement of the geopolitical and the geophysical, an entanglement that the (colonial and imperialising) discipline of geography has helped to articulate and produce even while proffering an explanation of the same. In pivoting back once more to the knotty matter of geopolitics and geophysics, what concepts and lexicons might be productive? Here, and thinking through the work that terrain has done and can do, I offer the multi-agential, survey defying, taxonomically mutable, drifting geographies of drift that have been so perturbing to a solid geology and its stratigraphic tempo, and hence can, perhaps, provide another resource from which to construe the political materialities of an Anthropocene.

Keywords

Anthropocene, drift, geology, geopolitics, materiality

Thank you to the organisers of this forum for the invitation to respond to Stuart Elden's (2021) plenary lecture, and to think through comments that I hope will constructively press on the main point of his paper as I see it – that terrain is a productive concept for understanding the 'political materiality' of territory, wherein materiality is not simply an end-product, nor is it a passive stuff existing within its own space-time continuum – and some of the wider disciplinary tenets that are expressly referenced, but also intimated therein. My own approach stems from a feminist materialist perspective, one that feels for the borders of thought and practice

across academia amid a plethora of knowledgeable sites, but in doing so interrogates the conceptual and methodological terrain it stands on, fashioning these anew (Dixon, 2016). Accordingly, I welcome the 'testing' of concepts such as terrain, but remain attentive to how such concepts arrive having already undertaken particular kinds of work; work that may

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be obscured in the fields and folds of our discipline but might nevertheless be a productive reservoir moving forward. Such an approach might well be described, as one anonymous reviewer of the submission 'Wonder-full Geomorphology' (Dixon et al., 2013) once put it, as a creative mining of geography's back catalogue.

Let me begin by saying that, in the context of an Anthropocene, I certainly see why an attentiveness to the 'geo' in terms such as geo-politics has highlighted the significance of those elemental geographies that are being 'forced' by global warming, ocean acidification, and mass movement. Leaving aside the heavy hand of Earth system science in shaping how such an Anthropocene has been framed, the impact of Earth system science on the articulation of Sustainable Development Goals, and current calls to integrate 'human systems' into so-called global change research programmes – leaving all this aside, I can understand why our concepts and ideas, our lexicons and imaginaries, also need to respond to such a 'condition'. The response articulated by Stuart is a reworking of terrain from a weaponised object of analysis to a concept that can undertake a critical, analytic work that helps illuminate a series of Anthropocene problematics that entangle the geopolitical and the geophysical.

To be sure, and given the tremendous work expected of the Earth sciences as a means of getting to grips with the nature and extent of an Anthropocene, there is a lot to be said about the politics inhering to and emerging from Geomorphology's turn towards understanding processes via an increasingly precise modelling of morphologies, and specifically the rapid proliferation of 'detection and attribution' methodologies (Brown et al., 2017). Where I would urge caution, however, is a sustained embeddedness of terrain in Geomorphology. If I can sum up, Stuart notes that from the mid-20th century onwards, terrain has fallen on one side of a form versus process divide in physical geography. And it has become linked to other binaries – inert over dynamic, dry over wet, land over water. Yet, most of the interesting, conceptually driven work on terrain in the Earth sciences, I suggest, comes not from Geomorphology but from Geology. And it is this history and

geography that, while it perturbs, I hope, assumptions about what a geological framing of an Anthropocene is, nevertheless very much lends itself to an Anthropocene condition. Specifically, while the stratigraphic impulse in Geology has quite rightly been critiqued for its all-consuming narrative of a new epoch (e.g. Colebrook, 2016), the geologic concept of the terrain provided, and continues to provide, a counter-impulse even as geologists struggle to integrate it into vertiginous and horizontal schemas.

Let me outline some of this terrain work. In the late 18th and early 19th century, terrain, or terrane, as the two spellings were used interchangeably, referred to an ensemble of morphologies relating to the same rock type laid down at the same time. The minority explanatory framework was Neptunism, exemplified by Abraham Werner's *Short Classification and Description of Rocks* (1787). Here, he set out what he called a geognostic, or empirical, classification of the lithic on the basis of age – in turn predicated on the sequence of differing material. Neptunism has rock settling out of suspension as a series of layers, with more fossils present in the newer ones. These morphologies could be exposed at the surface; or, they could be submerged by a new rock layer with its own morphologies. Terrains became part of the subterranean. Their exposure might strike the eye, but they existed as materials swept down into the depths of both space and time.

Into the 19th century there was a shift in the idea of what a terrain indeed made manifest ensuing from disquiet over the coeval nature of these morphologies. Could a singular tempo be assumed? Or, were there multiple tempos at work? Perhaps all that geologists could be sure of was simply a sequence of layers. As trained diplomat and mining engineer Jean-François D'Aubuisson de Voissins put it,

Le mot terrain est suivant pris pour synonyme de *formation*. Cependant, il a une acception plus étendue, et moins précis, surtout en ce qui concerne l'époque de la production... On peut admettre, qu'en géognosie les formations sont les espèces, les terrains seraient alors, et jusqu'à un certain point, les genres.

[The word terrane is often taken as a synonym for *formation*. However, its employment is more multifarious and less precise, especially regarding the epoch of production . . . One could say that geognosy formations are the species and, up to a point, terranes are the genera] (1828: 268–269).

While some British geologists kept to the idea of a terrain as holding to a rock type, the more common usage became terrain as a stratigraphic *system*. A terrain denoted a particular, vertically-orientated and horizontally-extended ensemble of strata featuring visible presences that have risen and fallen, but also traces of material that has gone elsewhere. Charles Lyell's *Principles of Geology* (1830) challenged Neptunism, for example, but retained the notion of terrains as layered; these layers being geological remains that could be explained by reference to processes now in operation and thus directly observable.

Not only did Lyell travel extensively, working with geologists, his work was also widely translated. It was popularised by the Marquis Lorenzo Pareto, for example, President of the Geological Section of the 1840 Congress of Italian Scientists, who argued that he had found the 'terrano miocene del lyell' – Lyell's Miocene terrain (Vaccari, 1998: 46). Such a *terrano* is interesting because it tells us something of how a geologic imaginary, predicated in stratigraphic systems, established difference and commonality at a global scale. That is, field sites across the globe were to be investigated as to how they made manifest an Earthly archive, their composition and fossils closely examined for matches with 'known' vertical cross-sections of time, such as Lyell's Miocene. To walk the landscape, as Lyell and Pareto did time and again, was to conjure up a series of morphologies that had been surficial, only to be submerged beneath the weight of new surfaces, each adding depth to a place that, because of its inundations and drying out, its accumulations and erosions, marked out a corner of the Earth as unique.

So far, so organised. Yet, there is another, parallel, use of terrain that deeply perturbed both the stratigraphic sequence, and the deep, elemental rootedness of place it facilitated. A good

introduction to this terrain, and its perturbing character, comes from the work of Mr. Peter Martin Esquire, who writes on the stratigraphy of the London Basin, and how his interlocutor might explain how,

the materials foreign to the stratified beds of the 'London basin' were derived, and perhaps venture some speculations respecting the boulder clays. He will intercalate here and there some fragment of a stratified bed of the older or newer pliocene. But will he tell us to what agencies we owe the intermingling of these discordant materials? Why have we 'drift', or more properly and significantly speaking, a 'terrain de transport'. (Martin 1857: 112)

The *terrain de transport*, or drift, comprises the detritus of unconsolidated sediments, such as boulders, gravel, sand, silt, and clay, that lie atop the consolidated layers of rock that is referred to as solid. Drift lies in discontinuous patches of disparately sized and chemically composite materials that are the product of river, lake, ice, marine, and aeolian depositions. And, it was a mystery.

Perhaps the key text on drift following Lyell's work is Sir Roderick Murchison's opus on *The Silurian System* (1839) based on field campaigns in south Wales. As with many of his colleagues, Murchison assumed considerable movement up and down, as mountains rose only to be submerged again – a movement that would profoundly impact global climate and hence maritime and terrestrial life – but no substantial horizontal movement. The terrains here provide glimpses into another epoch, characterised by a warm global climate that kept ice in retreat and sea levels high, and into which multi-cellular life crept onto land. Keen to compare and contrast these lithic archives with those found by 'foreign' geologists, Murchison was nonetheless at pains to account for a vertical, subterranean, British history of the Silurian that described the emergence not just of a present-day landscape, but of its very foundations. In a classic example of muscular geology, Murchison determined to name this system after the Celtic Silures tribe who, led by King Caractacus, had held off the

force of the Roman Empire, and ‘whose power extended over the region where these rocks are best displayed’ in the form of visible, ‘bold’ outcrops (1839: 7). In Chapter 38, Murchison turns to the matter of drift. Even the expertise of Murchison was thwarted, however, in the effort to work out which deposits were laid down first, as there was an ‘intermixture’ of local and foreign materials as well as a tendency for one temporal sequence to be upended at other sites (1839: 526–527). Rejecting the long-standing notion of the Great Deluge, drift, for Murchison, was a useful term because it indicated the many different processes – some known, others hypothesised, and all varying in presence and extent across the Earth – that had led to the mobilisation and laying down of these materials.

Current geological theorisations as to the movement of tectonic plates – a ‘continental drift’ – have unmoored Murchison’s vision of a succession of lithic materials rooted in a uniquely British corner of the globe. Tectonic drift theory has also seen a profound shift in the use of ‘terrane’ as system; for a while obsolete, it has now become a precision term for the arrival of an ‘exotic’ chunk of plate. The *terrain de transport* – the drift – remains, however, imprecise, obdurate, and productive. For the British Geological Survey (BGS), drift now includes waste heaps, embankments and reclamation fills, quarries, cuttings, and ‘disturbed ground’ (BGS *Rock Classification Scheme*, 1999: 5). And, it is this mobile, mutable material – escaping easy categorisation as an end-product, or a passive stuff existing within its own space-time continuum – that has become increasingly central to debates on the transformation of the environment in the Anthropocene.

As I have argued elsewhere, the materialities of drift upend the subterranean dramaturgy of the Anthropocene as a new geologic epoch, insofar as:

Drift, in sum, is more than a proof that space is no mere empty container. Its materiality is dynamic, entering into and extruding from the fields, homes, psyches and bodies of (geologized) human beings to be sure, but also crystallizing in a host of milieux that

capture and enhance Earthly forces . . . The smallest of particulate drift matter still floats in the wind, but now combines with hydrocarbons from combustion engines as well as soot, grit and smoke . . . Geology was never a simple, open terrain upon which everyday activities occur, but what the pervasive matter of drift now makes clear is the degree and intensity of anthropocentric, terraforming forces. Drift permeates alongside, beyond and within the human-geological wayfinder, host now to new forms of exposure and vulnerability, new voids and presences. (Dixon 2018: 134, 135)

Geology gives us a number of such concepts to work with when considering territory. And some of these have, certainly, become a means of shoring up the apparently vertiginous bedrock of the state. Drift – the *terrain de transport* of an Anthropocene – indicates and configures, however, a matter that perturbs roots and origins, as well as our distinctions between surface, below and above, inside and outside. Perhaps, it whirls or whorls other Earthly configurations, from bubbles and foam (Sloterdijk, 2011) to the mechanics of fluids (Irigaray, 1985).

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